Device for Closing Dead Zones with
SMA *Bluetooth*® Wireless Technology

SMA *BLUETOOTH* REPEATER

Installation Manual

BTRPIN-IA-eng-IUS113911 | 98-0045411 | Version 1.1

CA US

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions for the following product:

- SMA *Bluetooth*® Repeater

This manual must be followed during installation and maintenance.

The product is designed and tested according to international safety requirements, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the product. To reduce the risk of personal injury and to ensure the safe installation and operation of the product, you must carefully read and follow all instructions, cautions and warnings in this manual.

Warnings in this document

A warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the SMA equipment and/or other equipment connected to the SMA equipment or personal injury.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

Other Symbols in this document

In addition to the safety and hazard symbols described on the previous pages, the following symbol is also used in this manual:

Information

This symbol accompanies notes that call attention to supplementary information that you must know and use to ensure optimal operation of the system.

General Warnings

⚠ WARNING

General Warnings

All electrical installations must be done in accordance with the local and *National Electrical Code*® ANSI/NFPA 70 or the *Canadian Electrical Code*® CSA C22.1. This document does not and is not intended to replace any local, state, provincial, federal or national laws, regulation or codes applicable to the installation and use of the product, including without limitation applicable electrical safety codes. All installations must conform with the laws, regulations, codes and standards applicable in the jurisdiction of installation. SMA assumes no responsibility for the compliance or noncompliance with such laws or codes in connection with the installation of the product.

The product contains no user-serviceable parts. For all repair and maintenance, always return the unit to an authorized SMA Service Center.

Before installing or using the product, read all of the instructions, cautions, and warnings in this manual.

Wiring of the product must be made by qualified personnel only.

1 Information on this Manual

Validity

This manual is valid for the SMA *Bluetooth* Repeater, firmware version V 0.18R, and higher.

This manual does not contain any information on connected devices. Detailed information on connected devices is provided in the device manuals.

Target Group

This manual is for the use of skilled workers. Only qualified personnel are allowed to perform the tasks set forth in this manual (see Section 2.2 "Target Group Qualification", page 10).

Additional Information

Additional information is available at www.SMA-America.com.

Document Title	Document Type
SMA *Bluetooth*® Wireless Technology	Technical Description
SMA *Bluetooth*® Wireless Technology in Practice	Technical Information

Typography

Typography	Explanation	Example
"light"	Designates elements on a software user interface or display, or specifies device connections.	• The value can be read off in the "Energy" field.
bold	Designates elements that are to be selected or entered on a software user interface or display.	• Select **Settings**. • Enter **10** in the "Minutes" field.
>	Designates multiple elements that are to be selected on a software user interface or display.	• Select **Settings > Date**.
[Button/key]	Designates buttons or keys that are to be selected or pressed.	• Select [Next].

Nomenclature

In this manual, SMA America Production, LLC and SMA Solar Technology Canada Inc. are hereinafter referred to as SMA.

In this manual, SMA *Bluetooth*® Wireless Technology is referred to as *Bluetooth*.

In this manual, the SMA *Bluetooth*® Repeater is referred to as SMA *Bluetooth* Repeater.

In this manual, PV plants and small wind turbine systems are referred to collectively as "plants".

2 Safety

2.1 Intended Use

The SMA *Bluetooth* Repeater may only be used with the following SMA products:

- All SMA communication products with *Bluetooth*
- Inverters with SMA *Bluetooth* upgrade:
  - SB 3000US, SB 3800-US-10, SB 4000US
  - SB 5000US, SB 6000US, SB 7000US, SB 8000US
  - SB 8000TL-US, SB 9000TL-US, SB 10000TL-US
  - WB 3000US, WB 3800US
  - WB 5000US, WB 6000US, WB 7000US, WB 8000US
- Inverters with integrated *Bluetooth*:
  - SB 2000HF-US, SB 2500HF-US, SB 3000HF-US

Only use the SMA *Bluetooth* Repeater indoors.

Only skilled workers may install and uninstall the SMA *Bluetooth* Repeater.

Only use the SMA *Bluetooth* Repeater in accordance with the information provided in the enclosed documentation. Any other use can result in personal injury or property damage.

The enclosed documentation is an integral part of this product.

- For correct and optimum use of the SMA *Bluetooth* Repeater, read and follow the instructions in this documentation.
- Keep the documentation in a convenient place for future reference.

The SMA *Bluetooth* Repeater must only be used with original accessories from SMA or accessories recommended by SMA.

RF Exposure

This equipment should be installed and operated with minimum distance of 8 in. (20 cm) between the radiator and your body.

2.2 Target Group Qualification

Skilled workers have received adequate training and have demonstrated skills and knowledge in the installation and operation of this device. Skilled workers are trained to deal with the dangers and hazards involved in installing electrical installations.

2.3 Safety Instructions

⚠ DANGER

Risk of lethal electric shock

Death or serious injury due to high voltages is possible.

- Prior to performing any work on the inverter, disconnect the inverter on the AC and DC sides (see inverter installation manual).
- Only skilled workers may work on the inverter.

NOTICE

Electrostatic Discharge (ESD)

By touching electronic component parts, you can cause damage to or destroy the inverter through electrostatic discharge (ESD).

- Before touching any component part, ground yourself by touching the protective conductor (PE) or a non-coated part of the inverter enclosure.
- Wear protective clothing.
- Avoid coming into contact with component parts or plug contacts.

3 Product Description

3.1 Applications

Under unfavorable installation conditions, the SMA *Bluetooth* Repeater is used to bridge dead zones between SMA *Bluetooth* devices or to improve poor wireless connections.

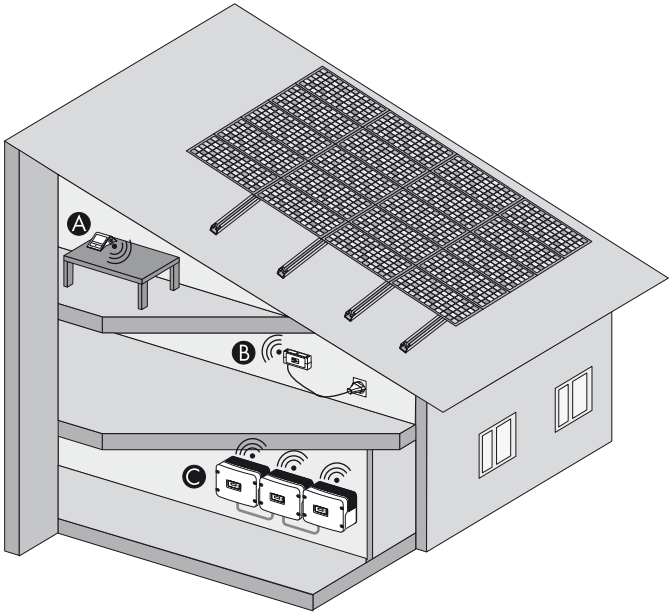


Figure 1: Example for the use of the SMA *Bluetooth* Repeater

Position	Designation
A	Communication device (here: Sunny Beam with *Bluetooth*)
B	SMA *Bluetooth* Repeater
C	SMA inverters with *Bluetooth*

3.2 Functions

- Connection to *Bluetooth* devices via *Bluetooth* Class 1.
- Maximum range in free-field conditions with direct visual contact up to 328 ft. (100 m). In closed rooms the range is dependent on various factors.

3.3 Device Overview

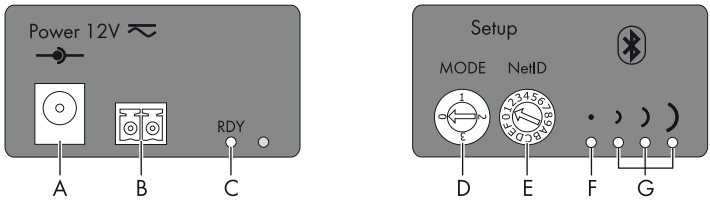


Figure 2: Overview of the device elements

Position	Designation
A	Plug-in power supply connection (AC)
B	Power Modul connection (do not use)*
C	"RDY" LED for power supply (green)
D	"MODE" rotary switch
E	"NetID" rotary switch
F	*Bluetooth* LED (blue)
G	Connection quality LEDs (yellow)

* Power Modul is not available in USA or Canada. In USA and Canada, mains connection can only be effected via the plug-in power supply.

3.4 Identifying the SMA *Bluetooth* Repeater

You can identify the SMA *Bluetooth* Repeater from the type label. The type label can be found on the right-hand side of the SMA *Bluetooth* Repeater.

4 Scope of Delivery

Check the delivery for completeness and for any visible damage. Contact your specialty retailer if the delivery is incomplete or you find any damage.

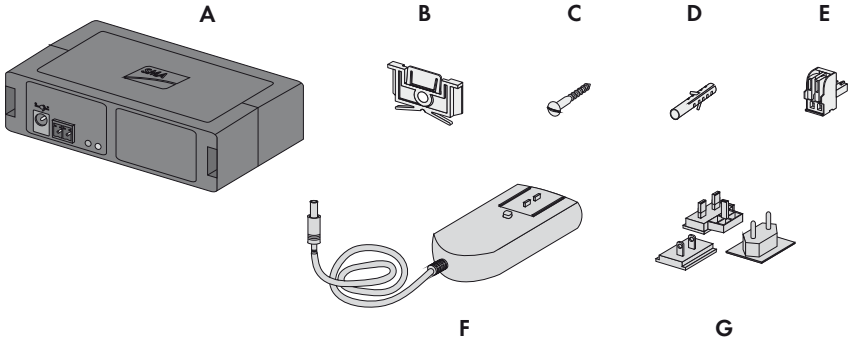


Figure 3: Components included in delivery

Position	Quantity	Designation
A	1	SMA *Bluetooth* Repeater
B	1	Bracket for wall mounting or top-hat rail mounting (can be found on the rear side of the SMA *Bluetooth* Repeater on delivery)
C	1	Screw
D	1	Screw anchors
E	1	2-pole plug for connection of power supply via the Power Modul*
F	1	Plug-in power supply
G	3	Plug adapters

* Power Modul is not available in USA or Canada. In USA and Canada, mains connection can only be effected via the plug-in power supply.

5 Mounting or Installing

You have the option or either installing or mounting the SMA *Bluetooth* Repeater.

5.1 Selecting the Mounting/Installation Location

Observe the requirements for the mounting/installation location:

- ☐ The mounting/installation location is indoors.
- ☐ The device is protected from dust, moisture and corrosive substances at the mounting location.
- ☐ Minimum clearances have been observed.

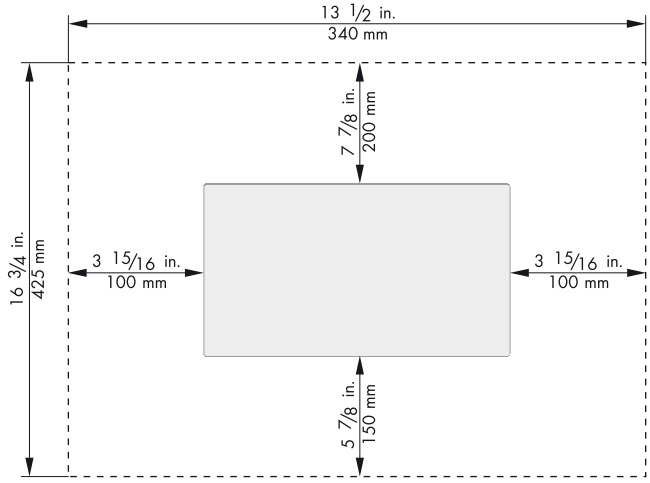


Figure 4: Minimum clearances to be observed

- ☐ The mounting/installation location is in the vicinity of a socket-outlet.
- ☐ Observe a minimum distance of 4 ft. (1m) to devices using the 2.4 GHz frequency band, e.g., Wi-Fi devices, microwave ovens. This is to prevent any reduction in connection quality or data transmission speed.

Determining the Mounting or Installation Location

Determine the mounting/installation location by varying the distance between the SMA *Bluetooth* Repeater and devices with a critical connection signal until all devices display at least a "good" signal.

Requirements:

- ☐ The "MODE" rotary switch is at position "0" (see Section 7.1 "Setting the MODE", page 20).
- ☐ The "NetID" rotary switch is set to the NetID of the plant (see Section 7.2 "Setting the NetID", page 20).

⚠ DANGER

Risk of lethal electric shock

Death or serious injury due to high voltages is possible.

- Prior to performing any work on the inverter, disconnect the inverter on the AC and DC sides (see inverter installation manual).
- Only skilled workers may work on the inverter.

1. Decommission the plant (see the manual of the inverter and of the communication product). This will ensure that the SMA *Bluetooth* Repeater is integrated into the SMA *Bluetooth* network at the point where the dead zone is located, thus improving the *Bluetooth* connection at that point.
2. Position the SMA *Bluetooth* Repeater half way between the devices with critical connection quality.
3. Connect the power supply (see Section 6 "Electrical Connection", page 19).
4. Recommission the plant (see the manual of the inverter and of the communication product).
5. Repeat the plant search with the communication device (see the communication product manual, e.g. Sunny Beam with *Bluetooth*, Sunny Explorer).
6. Ensure that the connection signal for all devices is at least "good". During this procedure, all devices must be in their usual positions (e.g., the Sunny Beam must not be held directly in front of the SMA *Bluetooth* Repeater):

Product	Good connection signal
SMA *Bluetooth* Repeater	1 blue and 2 yellow LEDs are on
Sunny Boy type SB xx00HF-30	At least 2 rings are shown in the inverter display
Other types of SMA inverters with SMA *Bluetooth* Piggy-Back or SMA *Bluetooth* Piggy-Back Plus	Check whether the connection signal is improved by using the SMA *Bluetooth* Repeater
Communication device (e.g. Sunny Beam with *Bluetooth*)	See the respective manual
Sunny Explorer	Move the mouse cursor over the radio symbol at the bottom right of the user interface A field indicating the signal strength is displayed.

☑ The connection signal displayed is at least "good" for all devices. Mount/install the SMA *Bluetooth* Repeater at this location.

✖ The connection signal displayed is not at least "good" for all devices?

- Move the SMA *Bluetooth* Repeater to another position and re-check the connection signals.
- If necessary, install additional SMA *Bluetooth* Repeaters.

5.2 Mounting the SMA *Bluetooth* Repeater

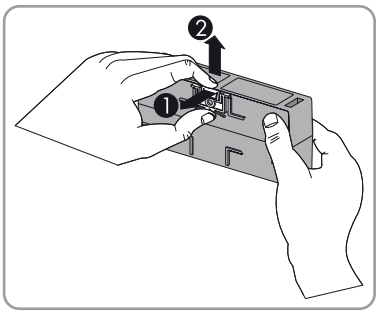
You can mount the SMA *Bluetooth* Repeater either on the wall or on a top-hat rail.

Mounting the SMA *Bluetooth* Repeater on the wall

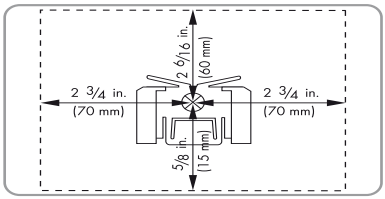
Mounting accessories required:

- 1 Bracket
- 1 Screw
- 1 screw anchor

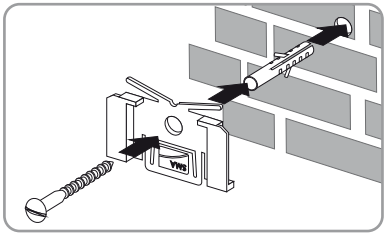
1. Remove the bracket from its guide on the rear side of the SMA *Bluetooth* Repeater. Lift the bracket via the strap and press against the Repeater guide rail.



2. Mark the position of the drill hole on the wall. Observe the distances between the drill hole and the enclosure sides.

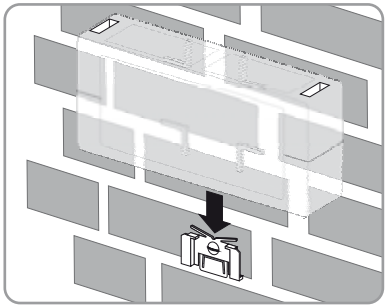


3. Drill a hole of a diameter $^{1}/_{4}$ in. (6 mm) at the position marked.
4. Attach the bracket to the wall using the screw anchor and the screw. Align the bracket so that both pins point upwards and the SMA logo faces to the front.



5. Push the SMA *Bluetooth* Repeater onto the bracket from above. Ensure that the SMA *Bluetooth* Repeater is aligned so that the SMA logo on the enclosure reads the right way round.

☑ There is an audible click as the SMA *Bluetooth* Repeater snaps into place.

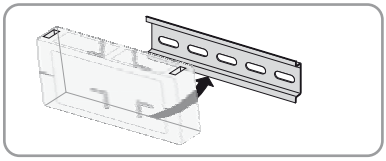


Mounting the SMA *Bluetooth* Repeater to a top-hat rail.

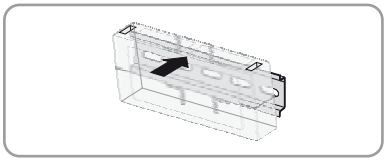
Mounting accessories required:

- 1 Bracket

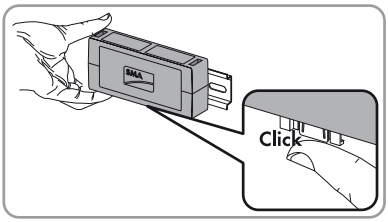
1. Lift the bracket via the strap and pull it out of the guide on the rear side of the SMA *Bluetooth* Repeater until it snaps into place. The bracket now slightly protrudes over the enclosure edge.
2. Hook the SMA *Bluetooth* Repeater into the top-hat rail from below.



3. Press the SMA *Bluetooth* Repeater towards the top-hat rail.



4. Press the SMA *Bluetooth* Repeater downwards.
5. Press the bracket into the guide until the bracket completely snaps into place.



6 Electrical Connection

⚠ WARNING

Danger of fire due to incorrect plug-in power supply

Technically unsuitable plug-in power supplies may cause a short circuit or fire.

- Use the plug-in power supply included as an accessory for the SMA *Bluetooth* Repeater.

1. Connect the country-specific socket-outlet adapter to the plug-in power supply; it snaps into place when inserted correctly.
2. Insert the plug-in power supply plug into the "Power 12V" terminal of the SMA *Bluetooth* Repeater.
3. Plug the plug-in power supply mains plug into the socket-outlet.
   ☑ The green "RDY" LED on the SMA *Bluetooth* Repeater lights up. The SMA *Bluetooth* Repeater is connected to the power supply.
   ✖ The "RDY" LED is off or flashing?

7 Settings

7.1 Setting the MODE

The "MODE" rotary switch is set to the position "0" for delivery. Other positions are not permitted and are intended for SMA Service only.

- If the "MODE" rotary switch is not set to the "0" position, turn the arrow on the "MODE" rotary switch to "0" using a 2.5 mm screwdriver.

7.2 Setting the NetID

The NetID serves to distinguish PV plants with SMA *Bluetooth* operating in close proximity to one another. All devices in one plant must have the same NetID. You can set the SMA *Bluetooth* Repeater to the NetID of your plant using the "NetID" rotary switch.

Assignment of rotary switch positions	
NetID	**Function**
0	Bluetooth is switched off.
1 (Default setting)	Bluetooth is switched on. The device can connect to a maximum of 2 communication products. The device cannot connect to other inverters or SMA *Bluetooth* Repeaters.
2 to 9 and A to F	Bluetooth is switched on. The device can link up with all SMA *Bluetooth* products having the same NetID.

NetID 1 is possible for plants with 1 inverter

You may leave the default NetID set to 1 in your inverter if your *Bluetooth* plant consists of the following products:

- A maximum of 1 inverter
- A maximum of 1 computer with *Bluetooth* and the Sunny Explorer software
- A maximum of 1 Sunny Beam of type BEAM-BT-11.GR1

or

- A maximum of 1 inverter
- A maximum of 2 Sunny Beams of type BEAM-BT-11.GR1

In all other cases you must determine a free NetID (see Sunny Explorer Help*).

* Sunny Explorer is a free software from SMA. You can obtain the Sunny Explorer in the download section of www.SMA-America.com.

- If you do not know the plant NetID, read off the NetID from one of the devices in the plant (e.g. Sunny WebBox with *Bluetooth* or inverter with *Bluetooth*).
- Use a 2.5 mm screwdriver to turn the arrow of the "NetID" rotary switch to the plant NetID.

8 Maintenance and Care

- Check the SMA *Bluetooth* Repeater regularly for external damage or soiling.
  - If external damage to the SMA *Bluetooth* Repeater is severe enough to impair correct function, replace the SMA *Bluetooth* Repeater.
  - If the SMA *Bluetooth* Repeater is soiled, wipe it clean with a moderately damp cloth. Any cleaning agents used must be non-abrasive and non-corrosive.

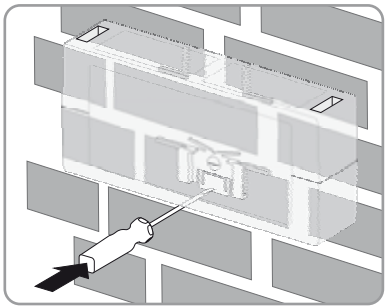
9 Decommissioning

- Pull the mains plug from the socket-outlet and remove the plug-in power supply from the SMA *Bluetooth* Repeater.

9.1 Dismantling the SMA *Bluetooth* Repeater

Detaching the SMA *Bluetooth* Repeater from the wall.

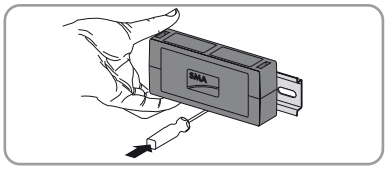
1. Push the SMA *Bluetooth* Repeater upwards and use a screwdriver to press it against the bracket.



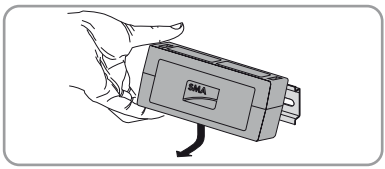
2. Slide the SMA *Bluetooth* Repeater upwards and out of the bracket.
3. Remove the screw from the wall and remove the bracket.

Detaching the SMA *Bluetooth* Repeater from the top-hat rail.

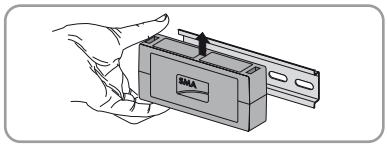
1. Push the SMA *Bluetooth* Repeater downwards and use a screwdriver to press it against the bracket. Pull the bracket downwards with the screwdriver and remove bracket.



2. Tilt the lower edge of the SMA *Bluetooth* Repeater forwards.



3. Push the SMA *Bluetooth* Repeater upwards to remove it from the top-hat rail.



9.2 Disposing of the SMA *Bluetooth* Repeater

- When disposing of the SMA *Bluetooth* Repeater at the installation site, observe the disposal regulations for electronic waste applicable on site.
- To have SMA dispose of the SMA *Bluetooth* Repeater:
  - Use packaging which adequately protects the device from damage during transport. Hint: If available, use the original packaging.
  - Send the SMA *Bluetooth* Repeater back to SMA at your own expense and marked with the information "FOR DISPOSAL".

10 Troubleshooting

10.1 Power Supply

"RDY" LED		
Status	**Significance**	**Measure**
Glows green continuously	The supply voltage is good. The SMA *Bluetooth* Repeater is in operation.	None
Flashes green and all other LEDs are off.	Supply voltage is too low. You may be using a plug-in power supply which is unsuitable for the SMA *Bluetooth* Repeater.	• Use only the plug-in power supply included as an accessory for the SMA *Bluetooth* Repeater.
Flashes green and all other LEDs are flashing	The SMA *Bluetooth* Repeater firmware is defective.	• Contact the SMA Serviceline.
Off	No supply voltage or the supply voltage is too low. The SMA *Bluetooth* Repeater is not in operation.	Check whether the socket-outlet is supplying voltage. • Do this, for example, by connecting a different device to the socket-outlet. If the socket-outlet is supplying voltage, either the plug-in power supply or the SMA *Bluetooth* Repeater itself is defective. – Replace the plug-in power supply. Use only the plug-in power supply included as an accessory for the SMA *Bluetooth* Repeater. – Replace the SMA *Bluetooth* Repeater.

10.2 Connection Signal

The SMA *Bluetooth* Repeater can only display a connection signal if it is integrated in an existing SMA *Bluetooth* network. The SMA *Bluetooth* network can only be established by master devices* . Devices will always display the connection signal to the device from which the connection has been established.

***Bluetooth* LEDs**			
Status			**Measure**
Blue LED	Yellow LEDs	Connection signal	
● Permanently on	●●● 3 LEDs are permanently lit	Very good	None
	●●⊗ 2 LEDs on	Good	None
	●⊗⊗ 1 LED is permanently lit	Unreliable	• Change the position of the SMA *Bluetooth* Repeater. **or** • Install additional SMA *Bluetooth* Repeaters.
	⊗⊗⊗ 3 LEDs off	Critical	
⊗ Off	⊗⊗⊗ 3 LEDs off	The SMA *Bluetooth* Repeater is not connected to the SMA *Bluetooth* network.	• Check the NetID. • Change the position of the SMA Bluetooth Repeater or install additional SMA *Bluetooth* Repeaters.
		There is no device with the same NetID within the radio range.	
		The SMA *Bluetooth* network has not been established. The establishment of a network can only be triggered by masters, e.g. communication products.	• Commission a master in the SMA *Bluetooth* network.
	✦✦✦ 3 LEDs flashing	The "NetID" rotary switch is set to position "1" or "0".	• Set the "NetID" rotary switch to the NetID of your plant (see Section 7.2).

* "Master" is a network engineering term. In a network, a master is a device that requests other devices (slaves) to receive or send data, for example. All communication products (e.g. Sunny Explorer, Sunny Beam with *Bluetooth*) are masters in an SMA *Bluetooth* network.

***Bluetooth* LEDs**			
Status			**Measure**
Blue LED	Yellow LEDs	Connection signal	
Flashing and "RDY" LED flashing green	3 LEDs flashing	The SMA *Bluetooth* Repeater firmware is defective.	• Contact the SMA Serviceline.

11 Technical Data

11.1 SMA *Bluetooth* Repeater

General data

Width x height x depth	5 1/2 in. x 1 1/2 in. x 3 in. (142 mm x 40 mm x 76 mm)
Weight	5 1/12 oz. (144 g)
Mounting / installation location	indoors
Mounting type	Top-hat rail / wall mounting bracket
Status display	LEDs
Degree of protection	NEMA 1

Voltage supply

AC voltage supply	Plug-in power supply
DC voltage supply	Power Modul
AC input voltage	12 V ... 24 V
Tolerance value for AC input voltage	± 10 %
Frequency of AC input voltage	50 Hz / 60 Hz
DC input voltage	12 V ... 24 V
Tolerance value for DC input voltage	± 20 %
Typical power consumption	0.8 W
Maximum power consumption	1.2 W

Environmental conditions in operation

Ambient temperature	– 4 °F ... +149 °F (– 20 °C ... +65 °C)
Relative humidity, non condensing	5 % ... 95 %
Altitude above mean sea level (MSL)	0 ft. ... 9 840 ft. (0 m ... 3 000 m)

Ambient Conditions during storage/transport

Ambient temperature	– 40 °F ... +158 °F (– 40 °C ... +70 °C)
Relative humidity, non condensing	10 % ... 95 %
Altitude above mean sea level (MSL)	0 ft. ... 9 840 ft. (0 m ... 3 000 m)

Communication

Inverter	*Bluetooth*
Data logger	*Bluetooth*
Range in open air	≤ 328 ft. (≤ 100 m)

11.2 Plug-in Power Supply (CINCON, TRG30R 120)

Mechanical data

Width x height x depth	4 1/4 in. x 2 9/32 in. x 1 5/16 in. (107.8 mm x 57.5 mm x 33.5 mm)
Weight	10 9/16 oz. (300 g)

Voltage supply

Voltage	100 V ... 240 V AC, 50 / 60 Hz
Nominal current	0.8 A

12 Compliance Information

FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A & B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that changes or modifications not expressly approved by SMA America, Inc. could void the user's authority to operate this equipment.

IC Compliance Information

This device complies with Industry of Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- This device may not cause interference, and
- This device must accept any interference, including interferences that may cause undesired operation of the device.

13 Contact

If you have technical problems concerning our products, contact the SMA Service Line. We require the following information in order to provide you with the necessary assistance:

- Type, serial number and firmware version of the inverter
- Serial number of the communication product
- Firmware version or software version of the communication product
- Serial number and firmware version of the SMA *Bluetooth* Repeater

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